

Claims

[c1] WHAT IS CLAIMED IS:

1. A device for exhaust gas after treatment of motor vehicles, the device comprising:

at least one pump device for supplying a solution to an exhaust gas manifold of a motor vehicle;

wherein the pump device (3) is a metering pump having at least one connecting part (15);

wherein the at least one connecting part (15) opens into the exhaust gas manifold (2);

wherein the at least one pump device (3) comprises at least one piston (6);

wherein the at least one pump device (3) comprises a piezo element (4) configured to actuate the at least one piston (6).

[c2] 2. The device according to claim 1, wherein the at least one connecting part (15) is tubular.

[c3] 3. The device according to claim 1, wherein the at least one pump device (3) has a housing (11) provided with a housing chamber (10), wherein the at least one connecting part (15) is arranged in the housing chamber (10) of the housing (11), wherein the housing chamber (10) is

provided preferably at an end face of the housing (11).

[c4] 4. The device according to claim 3, wherein the at least one connecting part (15) has a terminal collar (14) and wherein the terminal collar (14) is secured in the housing chamber (10).

[c5] 5. The device according to claim 4, wherein the at least one pump device (3) further comprises a first check valve (9) comprising at least one spring (13) resting against the terminal collar (14).

[c6] 6. The device according to claim 5, wherein the at least one pump device (3) has a pressure chamber (34) for receiving the solution and wherein the first check valve (9) is configured to close off the pressure chamber (34) relative to the at least one connecting part (15).

[c7] 7. The device according to claim 4, wherein the at least one connecting part (15) is an L-shaped pipe having a long pipe leg (17) and a short pipe leg (18), wherein the terminal collar (14) is provided on the long pipe leg (17) and wherein the short leg (18) extends substantially coaxially to the exhaust gas manifold (2).

[c8] 8. The device according to claim 1, wherein the at least one pump device (3) has a transmission element connected to the piston (6) and the piezo element (4).

- [c9] 9. The device according to claim 8, wherein the transmission element (5) is a pivot lever.
- [c10] 10. The device according to claim 8, wherein the transmission element (5) has two arms (26, 27) resting against an end face (28) of the piezo element (4) and an end face (29) of the piston (6), respectively.
- [c11] 11. The device according to claim 10, wherein the two arms (26, 27) are parallel to one another.
- [c12] 12. The device according to claim 8, wherein the piezo element (4) and the piston (6) extend parallel to one another.
- [c13] 13. The device according to claim 8, wherein the transmission element (5) has a stay connecting the two arms (26, 27) and wherein a pivot axis (25) of the transmission element (5) extends through the stay.
- [c14] 14. The device according to claim 13, wherein the pivot axis (25) is perpendicular to a sliding direction of the piston (6).
- [c15] 15. The device according to claim 3, wherein the piezo element (4) moves the piston (6) against a counterforce.
- [c16] 16. The device according to claim 6, wherein the housing

(11) of the at least one pump device (3) has a supply line (7) and wherein the piston (6) sucks in the solution from the supply line (7).

[c17] 17. The device according to claim 16, wherein the at least one pump device (3) has a second check valve (8) configured to close the supply line (7).

[c18] 18. The device according to claim 17, wherein the second check valve (8) is selected from the group consisting of a radially elastically deformable metal part, a sheet metal part and a sleeve.

[c19] 19. The device according to claim 17, wherein the second check valve (8) opens the supply line (7) in a direction toward the pressure chamber (34) as a result of a suction force caused by a return movement of the piston (6).

[c20] 20. The device according to claim 6, wherein the first check valve (9) opens as a result of a pressure force caused by sliding of the piston (6) in a direction toward the connecting part (15).

[c21] 21. The device according to claim 3, further comprising an electronic actuating device (24) for actuating the piezo element (4).

- [c22] 22. The device according to claim 21, wherein the electronic actuating device is arranged in the housing (11) of the pump device (3).
- [c23] 23. The device according to claim 22, wherein the piezo element (4) and the electronic actuating device (24) are provided on opposed sides of the piston (6).
- [c24] 24. The device according to claim 21, wherein the electronic actuating device (24) is arranged outside of the housing.
- [c25] 25. The device according to claim 3, wherein the housing (11) has an electronic connector (33).
- [c26] 26. The device according to claim 3, wherein the housing (11) has a mounting flange (23).